CWP- RCKSP 003

COYOTE CREEK AT ROCK SPRINGS
SAN JOSE, CALIFORNIA

ECONOMIC DAMAGES REPORT FOR THE WITHOUT PROJECT CONDITIONS

Prepared For

THE U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO DISTRICT

By

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ECONOMIC DAMAGES REPORT FOR THE WITHOUT PROJECT CONDITIONS

This report presents the economic analysis in determining the estimated average annual damages for the without project conditions for Coyote Creek at Rock Springs, San Jose, California. The economic analysis were prepared by Walter Yep, Inc. (WYI) under contract to the San Francisco District, U.S. Army Corps of Engineers.

The San Francisco District provided all hydrologic data. Eight events were included in the Corps Hydrologic Engineering Center, Flood Damage Assessment model, referred to as the FDA model in this report. The flood events were 2 years, 5 years, 10 years, 25 years, 50 years, 100 years, 250 years, and 500 years. Elevations were provided in meters. The economic analysis utilized the given probability discharge curves and stage discharge curves with uncertainties. The Economics Menu and Evaluation Menu were performed and reviewed by WYI economists. Key data and graphs are shown in the printouts contained in Appendix A. With this report are two computer disks containing the program and all entries utilized in this economic analysis of the without project conditions.

further South than Needles

The floodplain is within the City of San Jose and the Santa Clara Valley Water District (SCVWD). Flooding is from Coyote Creek. The floodplain is small; encompassing several blocks and is in a "bowl" configuration. The flood plain is delineated by Phelan Ave to the North; Senter Drive to the West; Needles Drive to the South; and Kelly Park and Coyote Creek to the West. The general description of flooding is over bank flooding from Coyote Creek with the "bowl" filling with floodwaters, inundating structures, and then receding.

East?

The floodplain inventory was based on three site visits and assessor parcel data for roll year 1998-1999. Within the 100-year floodplain, the principal land use is residential. There are 63 multiple unit structures, mostly two story fourplexes. The inventory included commercial units at the restaurant-medical building at the corner of Senter Drive and Nordale Avenue. The County Social Services Building at the corner of Needles

Drive and Rock Springs Drive was considered out of the floodplain. A complete inventory was conducted and no sampling was utilized.

TOTAL NUMBER OF STRUCTURES AND VALUES SUBJECT TO FLOODING
ALL VALUES LISTED IN OCTOBER 2000 PRICES IN $1,000'S

STRUCTURE TYPE	NUMBER OF STRUCTURES	NUMBER OF UNITS	TOTAL STRUCTURE VALUES	TOTAL CONTENT VALUE
COMMERCIAL - ONE STORY	1	1	$246	$246
SINGLE FAMILY RES - ONE STORY	2	2	$130	$65
MULTI-FAMILY RES - TWO STORY	61	248	$11,487	$5,744
TOTALS:	64	251	$11,863	$6,055

Improvement values were determined based on field observations and using the Marshall & Swift Valuation based on the square foot methodology. Building square footage was taken from parcel data for each structure. Value per square foot was determined based on field observations using categories from Marshall & Swift. For the majority of structures, it was determined that "Class D – Good Construction" was representative of the wood frame, stucco siding type structures found in the floodplain. The value per square foot ranged from $60 to $75 for multiple units to single family units of this class. Depreciation was factored based on estimated remaining life of the structures, with the average based on 85% of the full replacement value. For example, given square footage equal to 3500 square feet, the depreciated replacement value would have been estimated as 3500 X $68 X 0.85 for a value of ~ $200,000. Uncertainty was based on variance in both depreciation and value per square foot, with a coefficient of variation set 15% for residential structures.

The residential structure and content curves used were from Economic Guidance Memorandum (EGM) 01-03, Generic Depth-Damage Relationships. These curve were based on the Corps Institute for Water Resources study that included surveys from floods in various parts of the United States including Yuba County, California. For the one commercial structure, curves were based on the commercial-type S relationships from the 1969 Tennessee Valley Authority study. The commercial curves were used and verified in the Guadalupe River Project in the San Jose area.

Ground elevations were based on spot elevations and topographic lines shown of the floodplains provided. First floors were added to ground elevation based on averages observed during field inspection. Conversions were made to meters to be consistent with ground elevations and water surface elevations in the model. Uncertainty in first floor elevations was based on the factors listed in Engineering Manual (EM) 1110-2-1619 but adjusted to the 0.5 meter contours provided.

Photographs of the two story fourplexes are displayed in Appendix B. The structures are wood frames with stucco. The foundations are continuous concrete wall foundations with vents. All the units appeared to be fully occupied with a high-density population, three to four persons per unit. The field visits also confirmed a high number of automobiles with each housing unit.

Automobile damages were represented in the FDA model. The number of automobiles within the floodplain was based on the number of housing units not the number of structures. Based on field observations, it was determined that the average number of automobiles would be two per residential unit. It was also assumed that 50% of these automobiles would be out of the floodplain during the flood event (driven to work or evacuated prior to high water). To determine stationing and automobile elevation, residential structures were grouped to four cross-sections and the average station and elevation were estimated based on structure station and ground elevation. A value of $8,000 per automobile was based on observations made during field visitation. Total value of automobiles per station was entered into the FDA model with average ground elevations. Depth-damage curves were taken from the 1983 U.S. Soil Conservation Service study to determine percent damage to automobiles. Based on the depth-damage curves utilized, it would take a depth of 0.3 meters before automobile damages would occur.

Emergency costs were developed and applied in the FDA model. Stationing and elevation were determined same as for automobiles. An average emergency cost of $35 per person per day was taken from prior studies. Due to the low depths and historical repair practices in the area, emergency duration was limited to the inundation period, general clean up, and was based on three days. The total emergency costs were a function of number of units inundated X persons per unit X days of evacuation X daily cost of $35. Costs were then entered into the program as "other" values linked to the four cross-sections with average station and elevation. The "dummy relationship" was triggered when water surface elevation for a given event exceeds corresponding ground elevations at that station. If ground was greater that water surface, emergency costs were at 0%, equal to water surface – 50% (to account for some uncertainty) and ground less than water surface – 100%. Damages from this category were minimal. To

get significant emergency damages, the residents would have to be evacuated for an extended structural repair time, which has not occurred with the history of these structures.

Road damages were based on clean up, minor road repair and diminished road project life from frequent flooding. Magnitude of road damages was based on miles of road and average depth. Maximum damage was set at $23,000 per mile based on similar studies. Mileage, station, and average elevation were estimated for each of the five roads in the floodplain. Percent of maximum damage was based on water surface elevation for a given event minus average ground elevation.

Historic damages were only available for the storms of 1997. Newspaper accounts of the flooding are contained in Appendix C. The articles contain descriptions of other flooded areas along Coyote Creek and only limited accounts of the flooding in the Rock Springs area. Interviews with public safety agencies, nearby police and fire facilities did not yield additional data. The newspaper accounts were obtained from the Santa Clara Valley Water District, which had no further information on historical flooding.

The value of structures was estimated to be on a par with their land value. Land values are excluded from the FDA model estimates. The field visits also included interviews with several real estate offices near the floodplain to confirm market values.

Expected annual damages for the five damage categories under without project conditions and associated with the 100 year flood event are shown as:

Automobile	$49,700.00
Commercial	920.00
Emergency Costs	3,800.00
Residential	137,260.00
Roads	670.00
Total Damages	$192,350.00

APPENDIX A

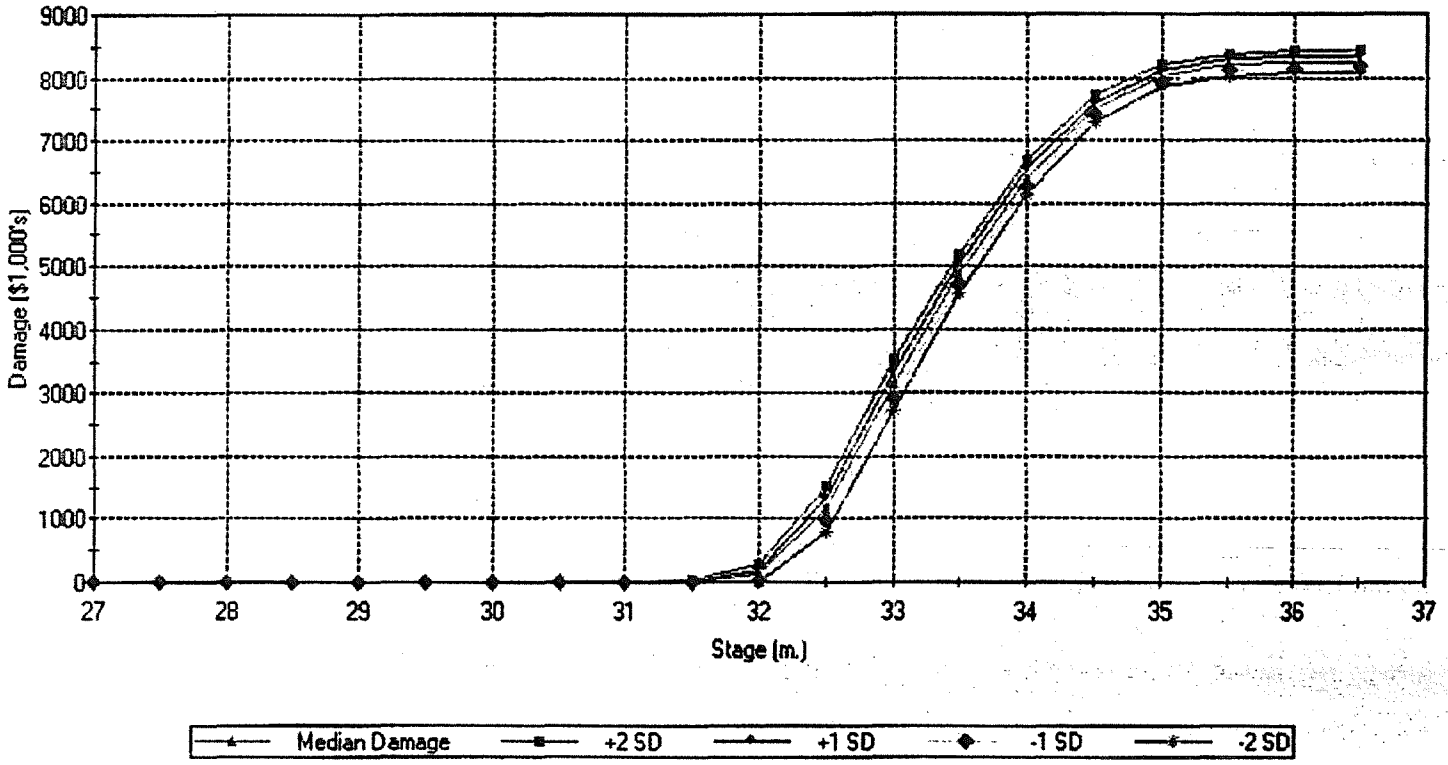
DATA AND GRAPHS

Stage-Damage Plot

File Help

Coyote Creek existing conditions
Stage-Damage Plot for AggDamg000240
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: RESIDENTIAL



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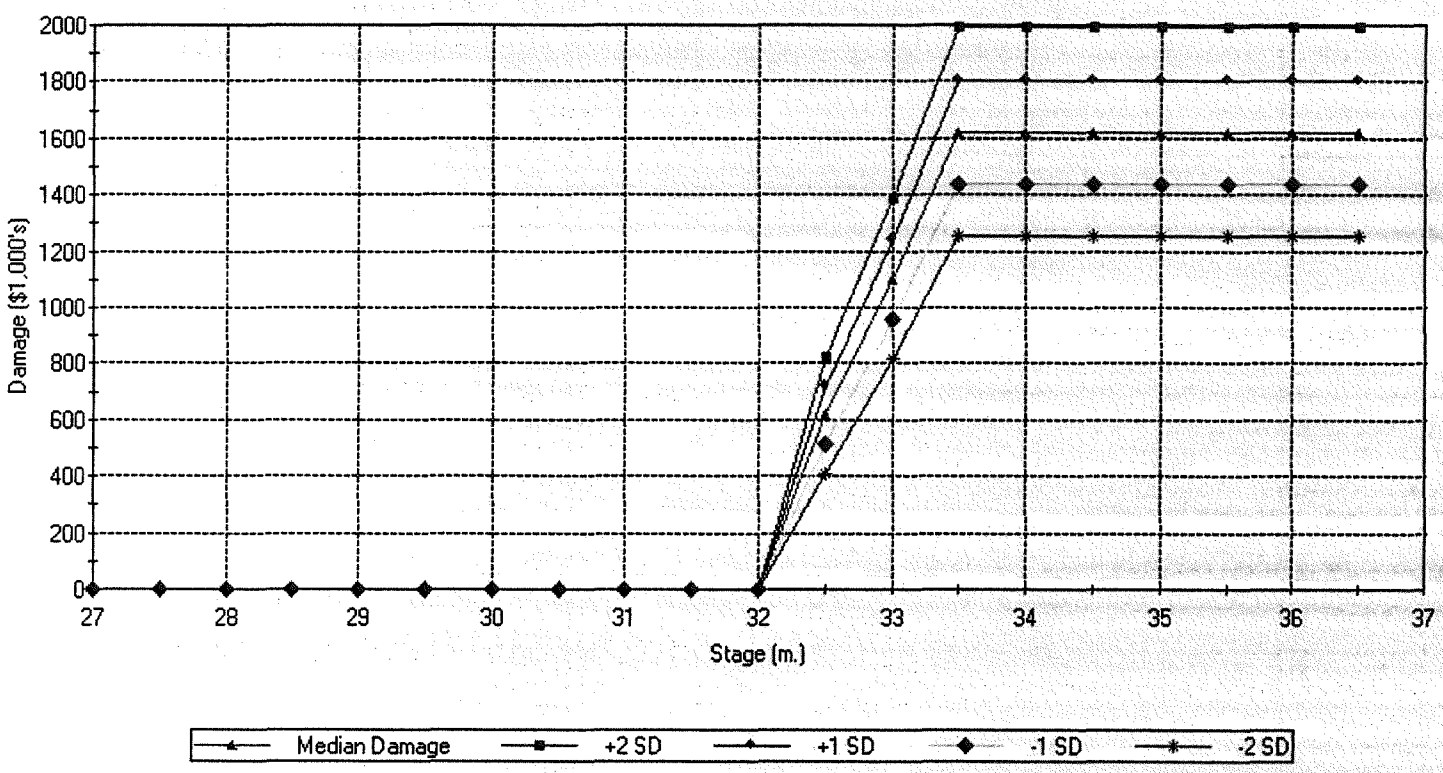
Stage-Damage Plot

e Help

Coyote Creek existing conditions
Stage-Damage Plot for AggDamg000237
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: AUTOS



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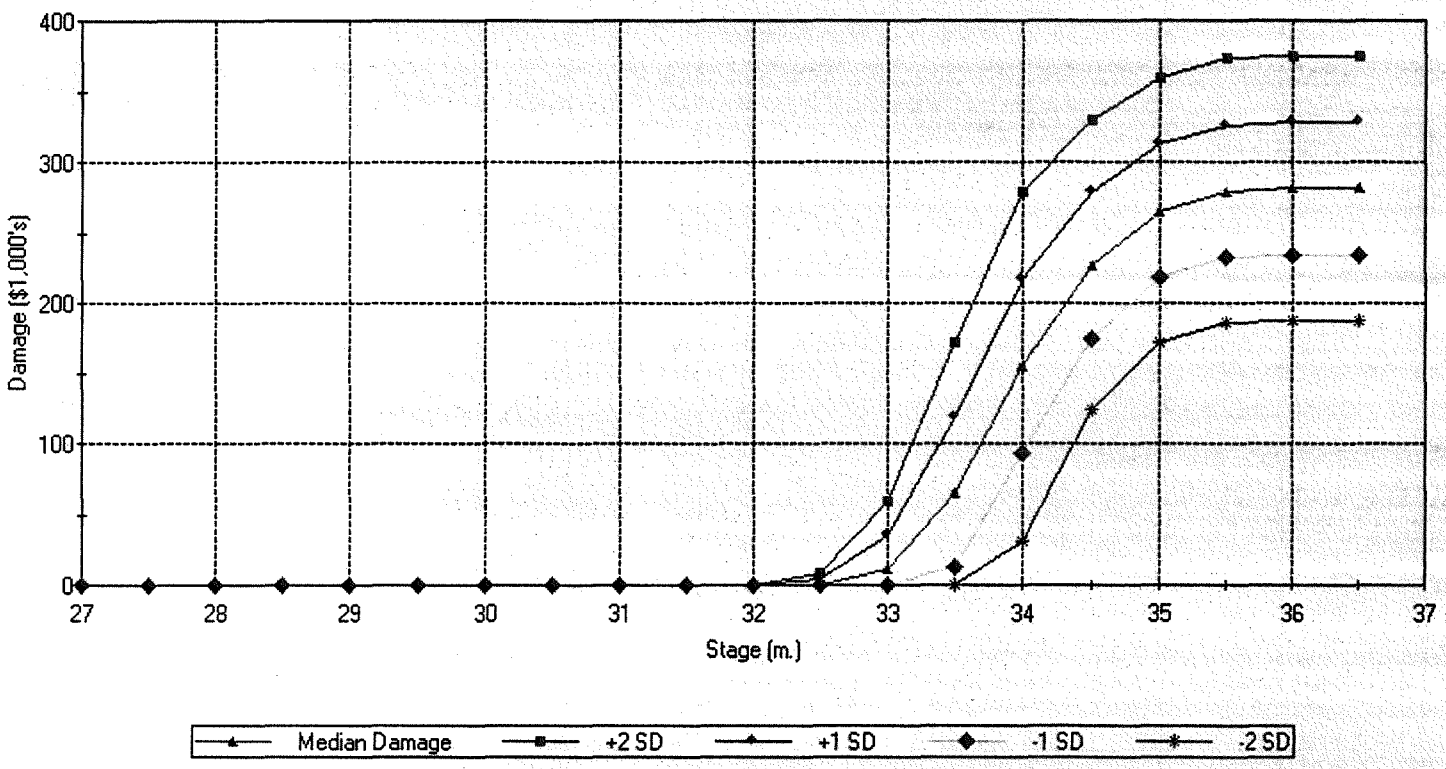
Stage-Damage Plot

e Help

Coyote Creek existing conditions
Stage-Damage Plot for AggDamg000238
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: COMM



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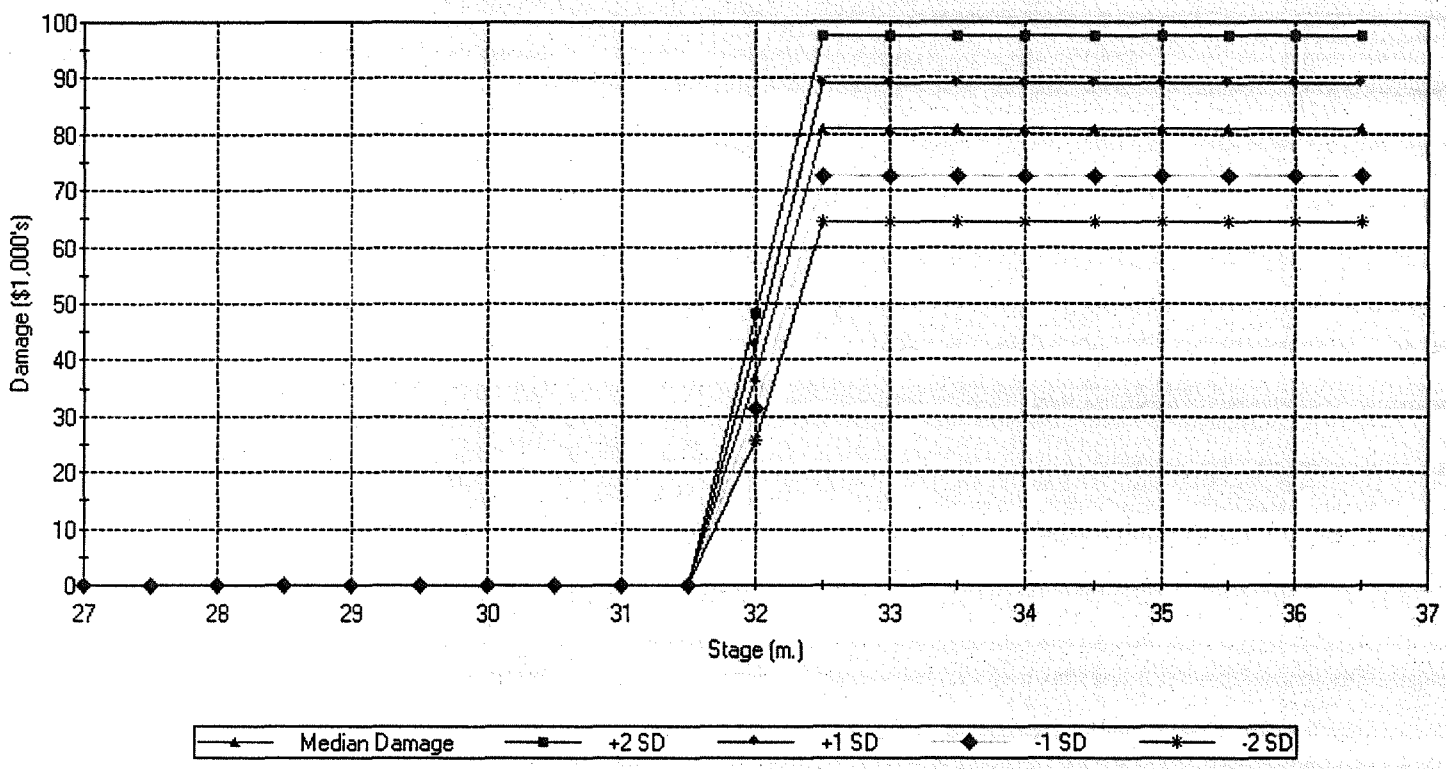
Stage-Damage Plot

e Help

Coyote Creek existing conditions
Stage-Damage Plot for AggDamg000239
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: EMERGENCY COSTS



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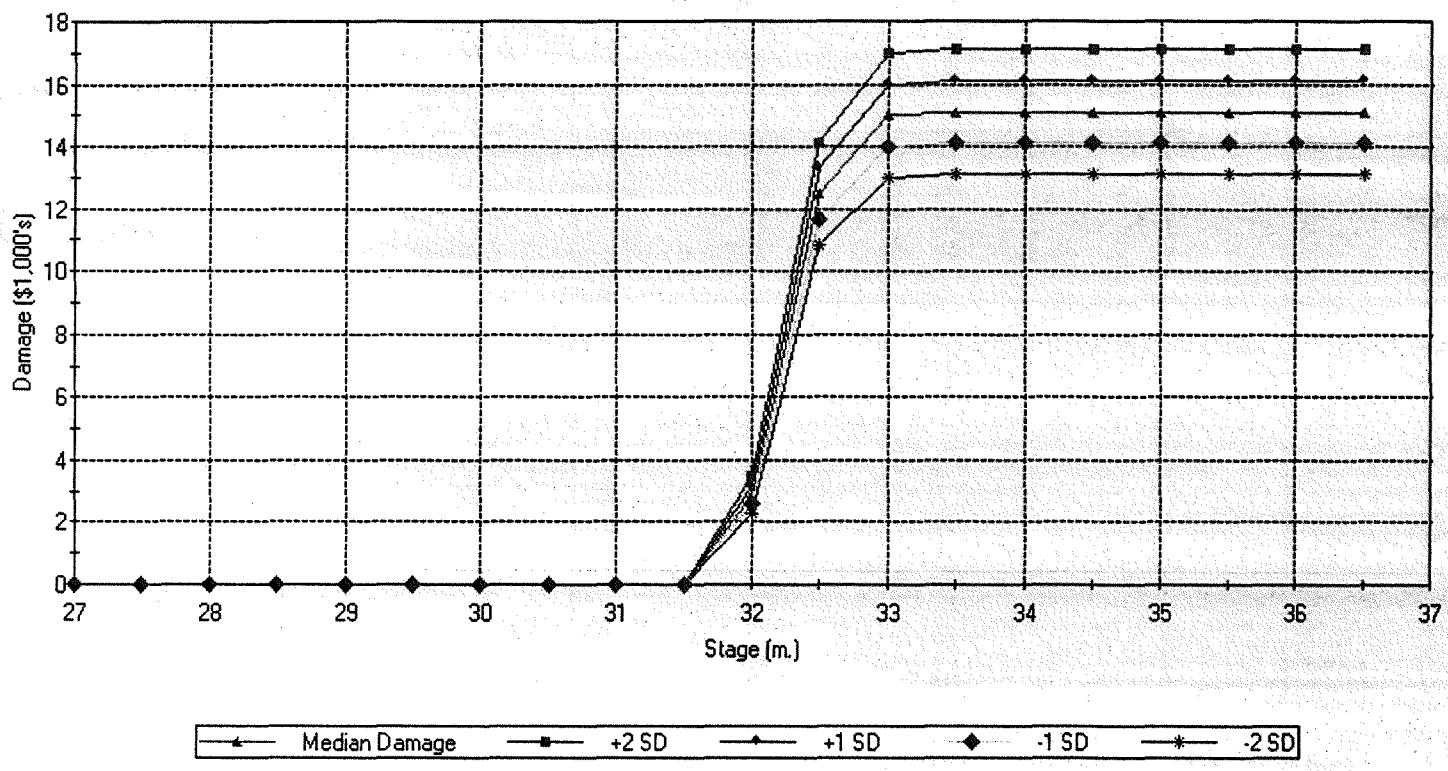
Stage-Damage Plot

e Help

Coyote Creek existing conditions
Stage-Damage Plot for AggDamg000241
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: ROADS



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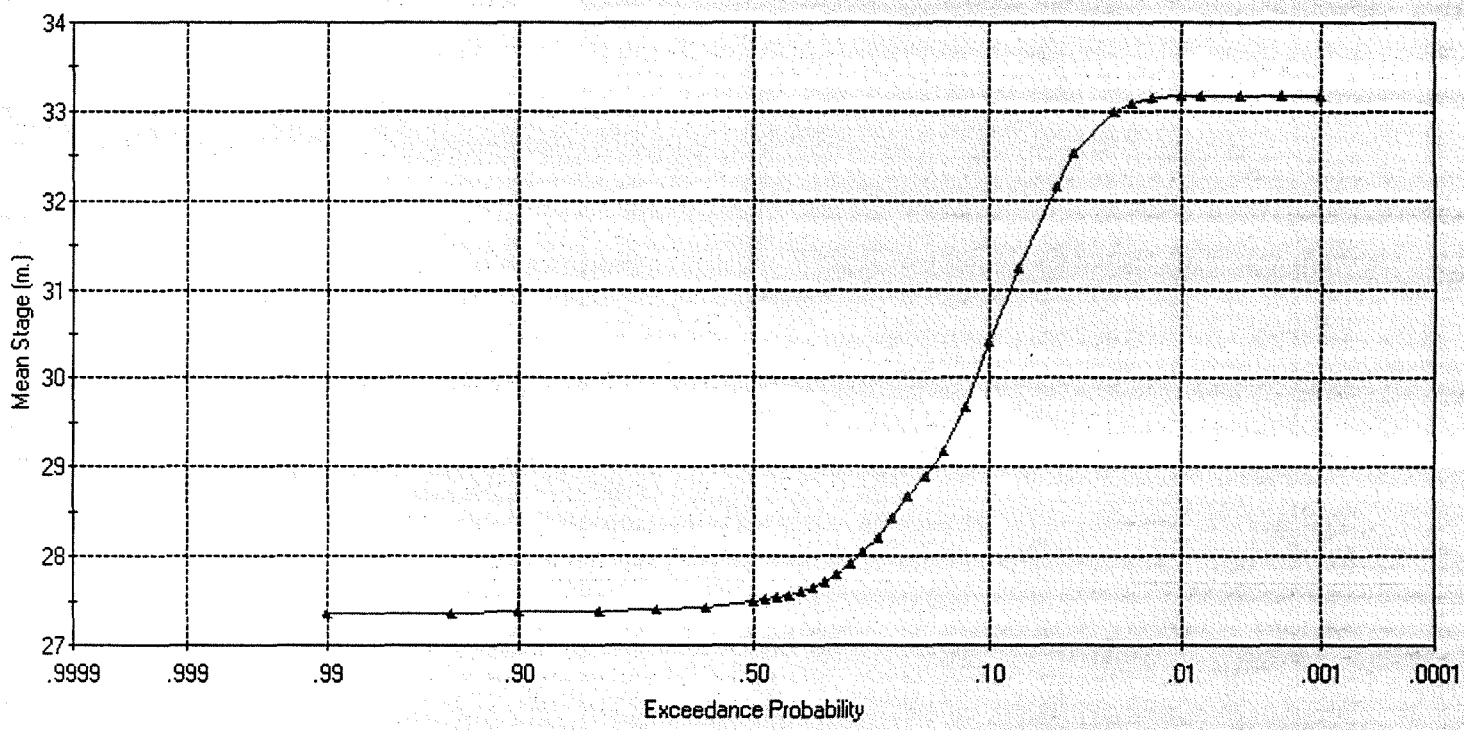
Damage by Analysis Year

Help

Coyote Creek existing conditions
Exceedance Probability - Mean Stage Function
for Damage Reach Rock Springs

n Name: Without, Without project condition
lysis Year: 2003
Stream Name: Coyote Creek



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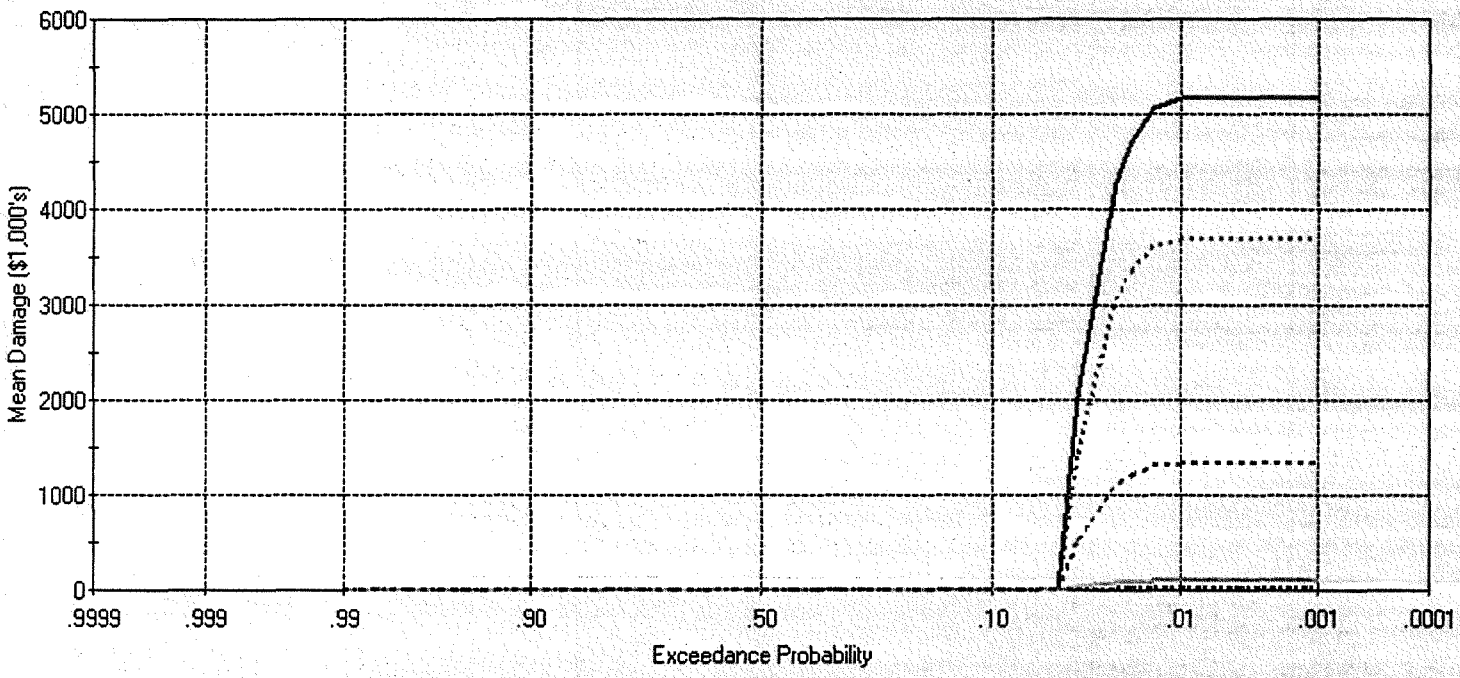
Damage by Analysis Year

e Help

Coyote Creek existing conditions
Exceedance Probability - Mean Damage Function
for Damage Reach Rock Springs

n Name: Without, Without project condition
lysis Year: 2003
eam Name: Coyote Creek



Total AUTOS COMM EMERGENCY COSTS RESIDENTIAL ROADS

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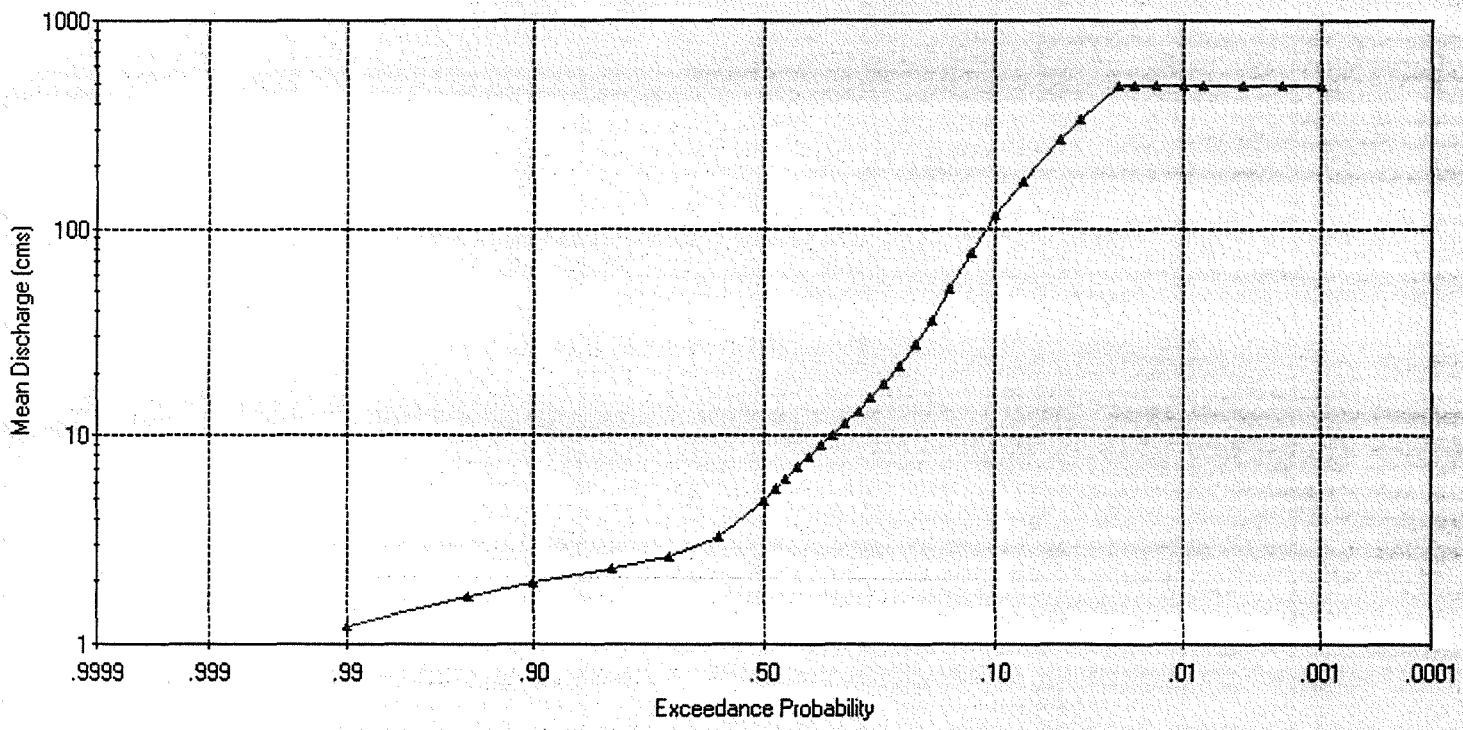
Damage by Analysis Year

e Help

Coyote Creek existing conditions
Exceedance Probablility - Mean Discharge Function
for Damage Reach Rock Springs

F n Name: Without, Without project condition
A alysis Year: 2003
Stream Name: Coyote Creek



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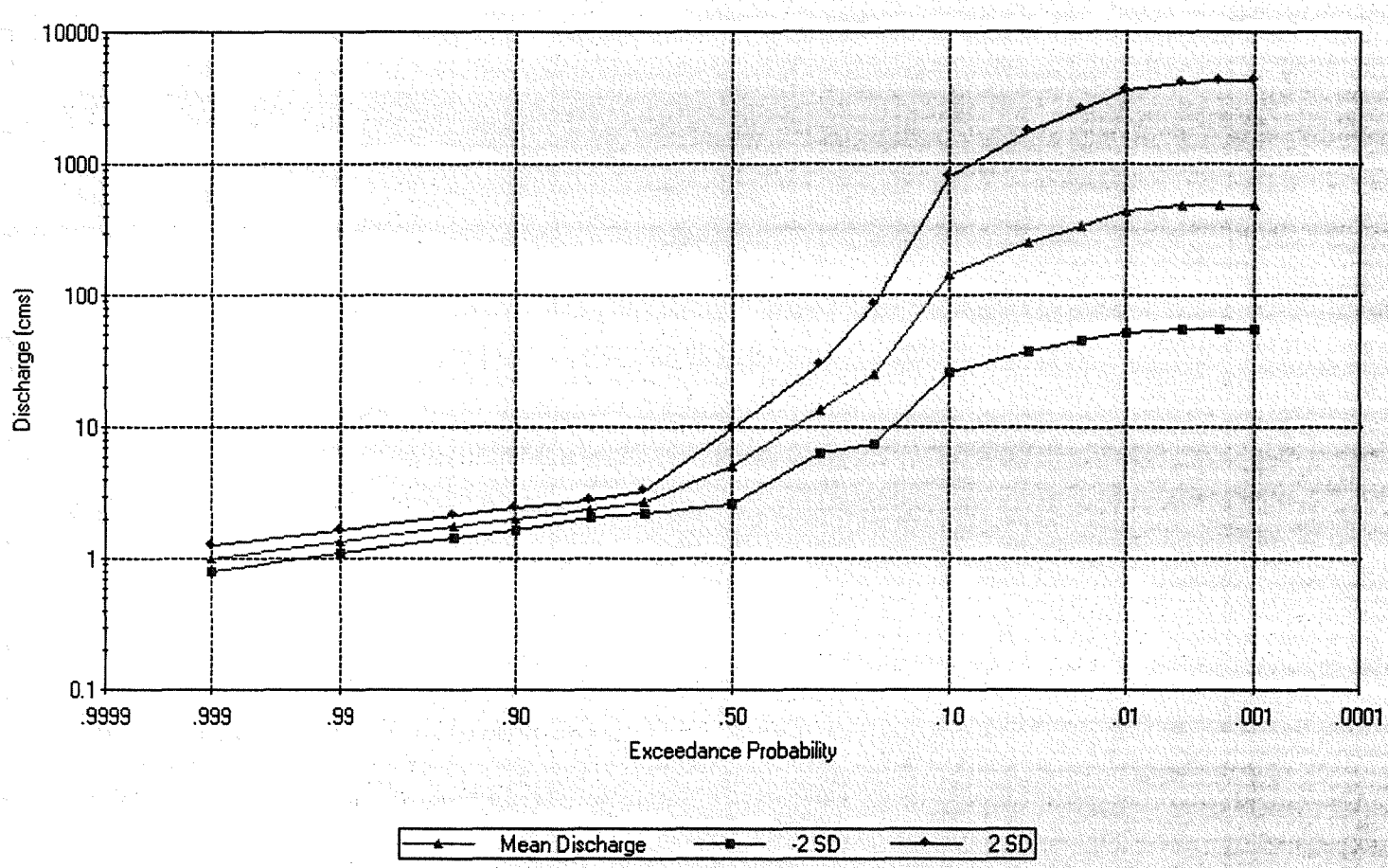
Exceedance Probability Function Plot

e Help

Coyote Creek existing conditions
Discharge-Probability Function Plot for coyote near eden
(Graphical)



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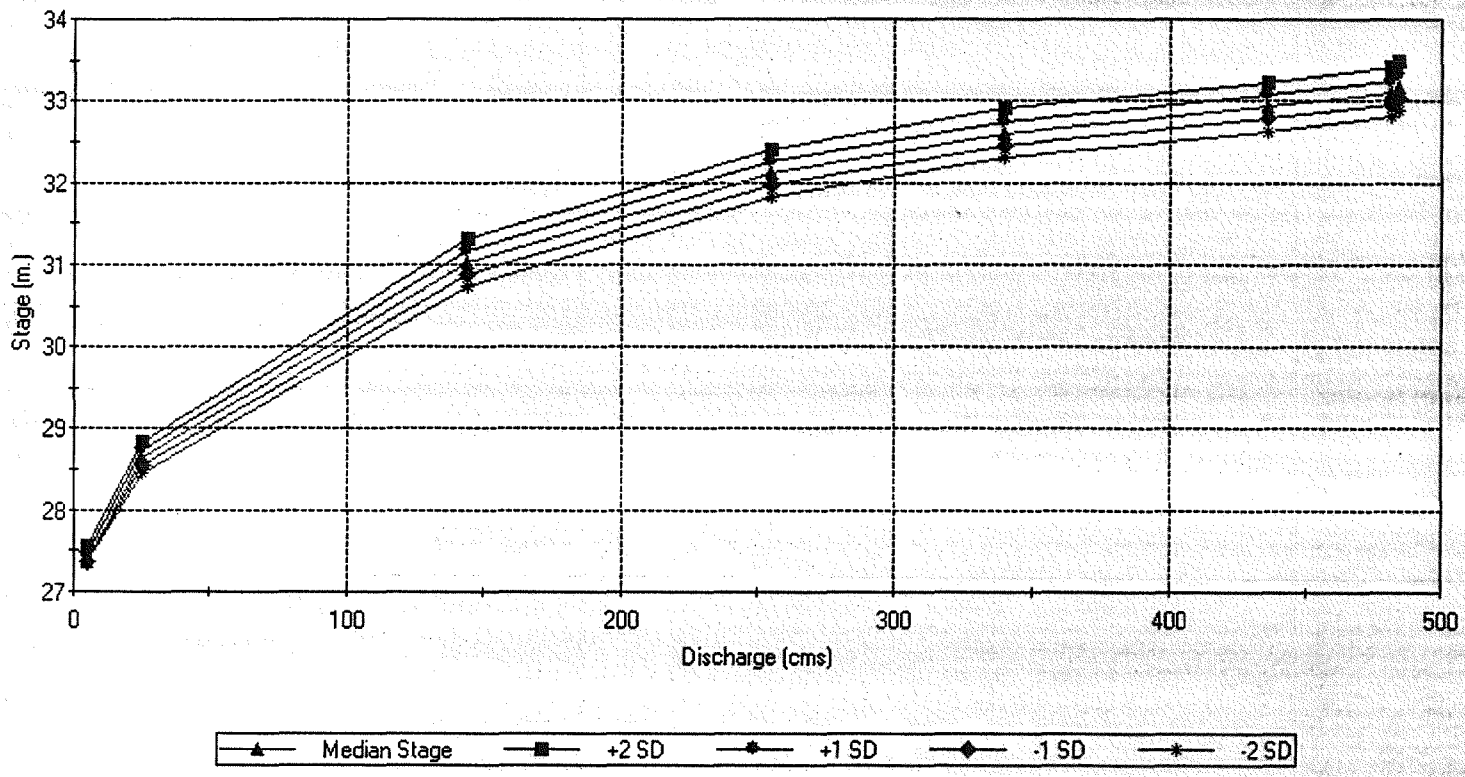
Stage-Discharge Plot

e Help

Coyote Creek existing conditions
Stage-Discharge Plot for STA 272.421
(Normal)

Plan Name: Without
alysis Year: 2003
eam Name: Coyote Creek
Damage Reach Name: Rock Springs



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List of All Structures for Coyote Creek existing conditions

Name	Stream Station	Bank	Year in Service	Structure Value ($1,000's)	Content Value ($1,000's)	Other Value ($1,000's)	Structure Stage: Structure Reference Elevation (m.)	Structure Stage: Foundation Height (m.)
? auto st 290	290.000	Left	1900	0.00	0.00	680.00	31.90	0.00
1718? ~~1738~~ Senter Rd.	320.000	Left	1900	246.00	246.00	0.00	33.00	0.15
1794? ~~1798~~ Welch Ave.	340.000	Left	1900	85.00	42.50	0.00	32.40	0.30
1704 Senter Rd.	320.000	Left	1900	45.00	22.50	0.00	33.50	0.30
1741 Welch Ave.	320.000	Left	1900	161.00	80.50	0.00	32.50	0.30
1753 Welch Ave.	330.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1767 Welch Ave.	340.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1779 Welch Ave.	350.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1795 Welch Ave.	360.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1807 Welch Ave.	360.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1821 Welch Ave.	370.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1833 Welch Ave.	380.000	Left	1900	161.00	80.50	0.00	32.50	0.30
1847 Welch Ave.	380.000	Left	1900	161.00	80.50	0.00	32.30	0.30
1846 Welch Ave.	380.000	Left	1900	161.00	80.50	0.00	32.40	0.30
1832 Welch Ave.	380.000	Left	1900	212.00	106.00	0.00	32.40	0.30
1820 Welch Ave.	340.000	Left	1900	212.00	106.00	0.00	32.40	0.30
1806 Welch Ave.	340.000	Left	1900	161.00	80.50	0.00	32.40	0.30
1780 Welch Ave.	340.000	Left	1900	161.00	80.50	0.00	32.40	0.30
1768 Welch Ave.	320.000	Left	1900	212.00	106.00	0.00	32.40	0.30
1754 Welch Ave.	320.000	Left	1900	212.00	106.00	0.00	32.40	0.30
1742 Welch Ave.	320.000	Left	1900	189.00	94.50	0.00	32.40	0.30
1769 Rock Spring	320.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1781 Rock Spring	320.000	Left	1900	161.00	80.50	0.00	32.50	0.30
1795 Rock Spring	320.000	Left	1900	161.00	80.50	0.00	32.50	0.30

List of All Structures for Coyote Creek existing conditions

s Beginning Depth Damage (m.)	Number of Structures	Structure Occupancy Type Name	Damage Category Name	Damage Reach Name	Stream Name
0.00	1	AUTOS	AUTOS	Rock Springs	Coyote Creek
0.15	1	COMM 1 ST	COMM	Rock Springs	Coyote Creek
0.30	1	ONE STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	ONE STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek

List of All Structures for Coyote Creek existing conditions

Name	Stream Station	Bank	Year in Service	Structure Value ($1,000's)	Content Value ($1,000's)	Other Value ($1,000's)	Structure Stage	
							Structure Reference Elevation (m.)	Foundation Height (m.)
1807 Rock Spring	320.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1821 Rock Spring	340.000	Left	1900	212.00	106.00	0.00	32.50	0.30
1833 Rock Spring	340.000	Left	1900	161.00	80.50	0.00	32.50	0.30
1847 Rock Spring	340.000	Left	1900	161.00	80.50	0.00	32.50	0.30
1743 Rock Spring	290.000	Left	1900	189.00	94.50	0.00	31.90	0.30
1755 Rock Spring	290.000	Left	1900	212.00	106.00	0.00	31.90	0.30
1818 Rock Spring	300.000	Left	1900	161.00	80.50	0.00	32.00	0.30
1804 Rock Spring	300.000	Left	1900	161.00	80.50	0.00	32.00	0.30
1792 Rock Spring	280.000	Left	1900	161.00	80.50	0.00	32.00	0.30
1778 Rock Spring	280.000	Left	1900	212.00	106.00	0.00	32.00	0.30
1768 Rock Spring	280.000	Left	1900	212.00	106.00	0.00	32.00	0.30
1754 Rock Spring	280.000	Left	1900	212.00	106.00	0.00	31.90	0.30
1742 Rock Spring	280.000	Left	1900	161.00	80.50	0.00	31.90	0.30
1740 Rock Spring	280.000	Left	1900	161.00	80.50	0.00	31.90	0.30
1840 Senter Rd.	390.000	Left	1900	212.00	106.00	0.00	32.40	0.30
1828 Senter Rd.	390.000	Left	1900	212.00	106.00	0.00	32.60	0.30
1816 Senter Rd.	390.000	Left	1900	212.00	106.00	0.00	32.80	0.30
1804 Senter Rd.	380.000	Left	1900	212.00	106.00	0.00	33.00	0.30
1792 Senter Rd.	360.000	Left	1900	212.00	106.00	0.00	33.20	0.30
1780 Senter Rd.	360.000	Left	1900	212.00	106.00	0.00	33.30	0.30
1744 Senter Rd.	360.000	Left	1900	201.00	100.50	0.00	33.30	0.30
665 Nordale Ave.	280.000	Left	1900	189.00	94.50	0.00	31.90	0.30
655 Nordale Ave.	300.000	Left	1900	189.00	94.50	0.00	31.90	0.30
661 Nordale Ave.	300.000	Left	1900	189.00	94.50	0.00	31.90	0.30

List of All Structures for Coyote Creek existing conditions

s Beginning Depth Damage (m.)	Number of Structures	Structure Occupancy Type Name	Damage Category Name	Damage Reach Name	Stream Name
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek

List of All Structures for Coyote Creek existing conditions

Name	Stream Station	Bank	Year in Service	Structure Value ($1,000's)	Content Value ($1,000's)	Other Value ($1,000's)	Structure Stage	
							Structure Reference Elevation (m.)	Foundation Height (m.)
651 Nordale Ave.	300.000	Left	1900	189.00	94.50	0.00	31.80	0.30
649 Nordale Ave.	300.000	Left	1900	200.00	100.00	0.00	31.80	0.30
641 Nordale Ave.	300.000	Left	1900	126.00	63.00	0.00	31.80	0.30
643 Nordale Ave.	300.000	Left	1900	189.00	94.50	0.00	31.80	0.30
645 Nordale Ave.	300.000	Left	1900	180.00	90.00	0.00	31.80	0.30
637 Nordale Ave.	300.000	Left	1900	189.00	94.50	0.00	31.70	0.30
639 Nordale Ave.	300.000	Left	1900	189.00	94.50	0.00	31.70	0.30
631 Nordale Ave.	300.000	Left	1900	189.00	94.50	0.00	31.70	0.30
633 Nordale Ave.	310.000	Left	1900	201.00	100.50	0.00	31.70	0.30
625 Nordale Ave.	310.000	Left	1900	189.00	94.50	0.00	31.80	0.30
627 Nordale Ave.	310.000	Left	1900	189.00	94.50	0.00	31.80	0.30
1848 Rock Spring	320.000	Left	1900	161.00	80.50	0.00	32.00	0.30
1836 Rock Spring	320.000	Left	1900	161.00	80.50	0.00	32.00	0.30
1832 Rock Spring	310.000	Left	1900	161.00	80.50	0.00	32.00	0.30
1828 Rock Spring	310.000	Left	1900	161.00	80.50	0.00	32.00	0.30
1768 Senter Rd.	340.000	Left	1900	189.00	94.50	0.00	33.20	0.30
1756 Senter Rd.	340.000	Left	1900	189.00	94.50	0.00	33.20	0.30
autos st 310	310.000	Left	1900	0.00	0.00	240.00	31.90	0.00
autos st330	330.000	Left	1900	0.00	0.00	536.00	32.50	0.00
autos st360	360.000	Left	1900	0.00	0.00	552.00	32.70	0.00
emer st290	290.000	Left	1900	0.00	0.00	27.00	31.90	0.00
emer st310	290.000	Left	1900	0.00	0.00	9.00	31.90	0.00
emer at 330	330.000	Left	1900	0.00	0.00	21.00	32.50	0.00
emer st360	360.000	Left	1900	0.00	0.00	22.00	32.70	0.00

List of All Structures for Coyote Creek existing conditions

s Beginning Depth Damage (m.)	Number of Structures	Structure Occupancy Type Name	Damage Category Name	Damage Reach Name	Stream Name
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.30	1	TWO STORY RES	RESIDENTIAL	Rock Springs	Coyote Creek
0.00	1	AUTOS	AUTOS	Rock Springs	Coyote Creek
0.00	1	AUTOS	AUTOS	Rock Springs	Coyote Creek
0.00	1	AUTOS	AUTOS	Rock Springs	Coyote Creek
0.00	1	EMER COSTS	EMERGENCY COSTS	Rock Springs	Coyote Creek
0.00	1	EMER COSTS	EMERGENCY COSTS	Rock Springs	Coyote Creek
0.00	1	EMER COSTS	EMERGENCY COSTS	Rock Springs	Coyote Creek
0.00	1	EMER COSTS	EMERGENCY COSTS	Rock Springs	Coyote Creek

List of All Structures for Coyote Creek existing conditions

Name	Stream Station	Bank	Year in Service	Structure Value ($1,000's)	Content Value ($1,000's)	Other Value ($1,000's)	Structure Stage	
							Structure Reference Elevation (m.)	Foundation Height (m.)
ROAD RS	290.000	Left	1900	0.00	0.00	3.03	32.00	0.00
ROAD NORD	310.000	Left	1900	0.00	0.00	2.50	31.80	0.00
ROAD WELCH	330.000	Left	1900	0.00	0.00	3.00	32.40	0.00
ROAD NEEDLES	380.000	Left	1900	0.00	0.00	2.50	32.30	0.00
ROAD SENTER	360.000	Left	1900	0.00	0.00	3.80	32.50	0.00

List of All Structures for Coyote Creek existing conditions

s Beginning Depth Damage (m.)	Number of Structures	Structure Occupancy Type Name	Damage Category Name	Damage Reach Name	Stream Name
0.00	1	ROAD DAM	ROADS	Rock Springs	Coyote Creek
0.00	1	ROAD DAM	ROADS	Rock Springs	Coyote Creek
0.00	1	ROAD DAM	ROADS	Rock Springs	Coyote Creek
0.00	1	ROAD DAM	ROADS	Rock Springs	Coyote Creek
0.00	1	ROAD DAM	ROADS	Rock Springs	Coyote Creek

Coyote Creek existing conditions Project Performance
by Damage Reaches for the Without
(Without project condition) plan for Analysis Year 2003
(Stages in m.)
Plan was calculated with Uncertainty

Without Project Base Year Performance Target Criteria:
Event Exceedance Probablility = 0.01
Residual Damage = 5.00 %

Long-Term Risk (years)			Conditional Non-Exceedance Probability by Events					
10	25	50	10%	4%	2%	1%	.4%	.2%
0.3926	0.7124	0.9173	0.7664	0.5268	0.4149	0.3311	0.3011	0.2994

Coyote Creek existing conditions Project Performance
by Damage Reaches for the Without
(Without project condition) plan for Analysis Year 2003
(Stages in m.)
Plan was calculated with Uncertainty

Without Project Base Year Performance Target Criteria:
Event Exceedance Probablility = 0.01
Residual Damage = 5.00 %

Stream Name	Stream Description	Damage Reach Name	Damage Reach Description	Target Stage	Target Stage Annual Exceedance Probability	
					Median	Expected
Coyote Creek	Coyote at Rock Springs 205 study	Rock Springs		levee	0.0350	0.0490

Coyote Creek existing conditions
Stage-Damage Report for AggDamg000237
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: AUTOS

Stage (m.)	Damage ($1,000's)	Error Limit Curves Damage ($1,000's)			
		-2 SD	-1 SD	+1 SD	+2 SD
27.00	0.000	0.000	0.000	0.000	0.000
27.50	0.000	0.000	0.000	0.000	0.000
28.00	0.000	0.000	0.000	0.000	0.000
28.50	0.000	0.000	0.000	0.000	0.000
29.00	0.000	0.000	0.000	0.000	0.000
29.50	0.000	0.000	0.000	0.000	0.000
30.00	0.000	0.000	0.000	0.000	0.000
30.50	0.000	0.000	0.000	0.000	0.000
31.00	0.000	0.000	0.000	0.000	0.000
31.50	0.000	0.000	0.000	0.000	0.000
32.00	0.000	0.000	0.000	0.000	0.000
32.50	616.21	410.69	513.47	718.95	821.73
33.00	1099.80	814.64	957.25	1242.35	1384.96
33.50	1620.45	1250.83	1435.67	1805.23	1990.07
34.00	1620.45	1250.83	1435.67	1805.23	1990.07
34.50	1620.45	1250.83	1435.67	1805.23	1990.07
35.00	1620.45	1250.83	1435.67	1805.23	1990.07
35.50	1620.45	1250.83	1435.67	1805.23	1990.07
36.00	1620.45	1250.83	1435.67	1805.23	1990.07
36.50	1620.45	1250.83	1435.67	1805.23	1990.07

Coyote Creek existing conditions
Stage-Damage Report for AggDamg000238
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: COMM

Stage (m.)	Damage ($1,000's)	Error Limit Curves Damage ($1,000's)			
		-2 SD	-1 SD	+1 SD	+2 SD
27.00	0.000	0.000	0.000	0.000	0.000
27.50	0.000	0.000	0.000	0.000	0.000
28.00	0.000	0.000	0.000	0.000	0.000
28.50	0.000	0.000	0.000	0.000	0.000
29.00	0.000	0.000	0.000	0.000	0.000
29.50	0.000	0.000	0.000	0.000	0.000
30.00	0.000	0.000	0.000	0.000	0.000
30.50	0.000	0.000	0.000	0.000	0.000
31.00	0.000	0.000	0.000	0.000	0.000
31.50	0.000	0.000	0.000	0.000	0.000
32.00	0.000	0.000	0.000	0.000	0.000
32.50	0.39	0.000	0.000	4.30	8.21
33.00	10.58	0.000	0.000	35.10	59.62
33.50	65.48	0.000	12.50	118.46	171.46
34.00	155.20	31.54	93.38	217.02	278.86
34.50	226.72	123.74	175.24	278.20	329.70
35.00	265.32	171.20	218.27	312.37	359.44
35.50	279.16	185.44	232.31	326.01	372.88
36.00	281.27	187.33	234.31	328.23	375.21
36.50	281.33	187.49	234.42	328.24	375.17

Coyote Creek existing conditions
Stage-Damage Report for AggDamg000239
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: EMERGENCY COSTS

Stage (m.)	Damage ($1,000's)	Error Limit Curves Damage ($1,000's)			
		-2 SD	-1 SD	+1 SD	+2 SD
27.00	0.000	0.000	0.000	0.000	0.000
27.50	0.000	0.000	0.000	0.000	0.000
28.00	0.000	0.000	0.000	0.000	0.000
28.50	0.000	0.000	0.000	0.000	0.000
29.00	0.000	0.000	0.000	0.000	0.000
29.50	0.000	0.000	0.000	0.000	0.000
30.00	0.000	0.000	0.000	0.000	0.000
30.50	0.000	0.000	0.000	0.000	0.000
31.00	0.000	0.000	0.000	0.000	0.000
31.50	0.000	0.000	0.000	0.000	0.000
32.00	36.89	25.61	31.25	42.53	48.17
32.50	80.95	64.43	72.69	89.21	97.47
33.00	80.95	64.43	72.69	89.21	97.47
33.50	80.95	64.43	72.69	89.21	97.47
34.00	80.95	64.43	72.69	89.21	97.47
34.50	80.95	64.43	72.69	89.21	97.47
35.00	80.95	64.43	72.69	89.21	97.47
35.50	80.95	64.43	72.69	89.21	97.47
36.00	80.95	64.43	72.69	89.21	97.47
36.50	80.95	64.43	72.69	89.21	97.47

Coyote Creek existing conditions
Stage-Damage Report for AggDamg000240
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: RESIDENTIAL

Stage (m.)	Damage ($1,000's)	Error Limit Curves Damage ($1,000's)			
		-2 SD	-1 SD	+1 SD	+2 SD
27.00	0.000	0.000	0.000	0.000	0.000
27.50	0.000	0.000	0.000	0.000	0.000
28.00	0.000	0.000	0.000	0.000	0.000
28.50	0.000	0.000	0.000	0.000	0.000
29.00	0.000	0.000	0.000	0.000	0.000
29.50	0.000	0.000	0.000	0.000	0.000
30.00	0.000	0.000	0.000	0.000	0.000
30.50	0.000	0.000	0.000	0.000	0.000
31.00	0.000	0.000	0.000	0.000	0.000
31.50	3.10	0.000	0.000	15.82	28.54
32.00	121.44	0.000	43.01	199.87	278.32
32.50	1163.19	804.37	983.81	1342.57	1522.01
33.00	3123.16	2732.80	2928.02	3318.30	3513.52
33.50	4876.93	4568.31	4722.65	5031.21	5185.55
34.00	6415.05	6138.87	6276.99	6553.11	6691.23
34.50	7510.01	7290.13	7400.09	7619.93	7729.89
35.00	8032.36	7843.92	7938.16	8126.56	8220.80
35.50	8201.92	8027.66	8114.81	8289.03	8376.18
36.00	8243.40	8072.82	8158.13	8328.67	8413.98
36.50	8250.03	8079.89	8164.98	8335.08	8420.17

Coyote Creek existing conditions
Stage-Damage Report for AggDamg000241
(Normal)

Plan Name: Without
Analysis Year: 2003
Stream Name: Coyote Creek
Damage Reach Name: Rock Springs
Damage Category Name: ROADS

Stage (m.)	Damage ($1,000's)	Error Limit Curves Damage ($1,000's)			
		-2 SD	-1 SD	+1 SD	+2 SD
27.00	0.000	0.000	0.000	0.000	0.000
27.50	0.000	0.000	0.000	0.000	0.000
28.00	0.000	0.000	0.000	0.000	0.000
28.50	0.000	0.000	0.000	0.000	0.000
29.00	0.000	0.000	0.000	0.000	0.000
29.50	0.000	0.000	0.000	0.000	0.000
30.00	0.000	0.000	0.000	0.000	0.000
30.50	0.000	0.000	0.000	0.000	0.000
31.00	0.000	0.000	0.000	0.000	0.000
31.50	0.000	0.000	0.000	0.000	0.000
32.00	2.88	2.28	2.58	3.18	3.48
32.50	12.50	10.86	11.68	13.32	14.14
33.00	14.99	13.01	14.00	15.98	16.97
33.50	15.11	13.11	14.11	16.11	17.11
34.00	15.11	13.11	14.11	16.11	17.11
34.50	15.11	13.11	14.11	16.11	17.11
35.00	15.11	13.11	14.11	16.11	17.11
35.50	15.11	13.11	14.11	16.11	17.11
36.00	15.11	13.11	14.11	16.11	17.11
36.50	15.11	13.11	14.11	16.11	17.11

Coyote Creek existing conditions
Exceedance Probablility - Damage Functions
for Damage Reach Rock Springs
(Damage in $1,000's)

Plan Name: Without, Without project condition
Analysis Year: 2003
Stream NameCoyote Creek

Exceedance Probability	Damage by Damage Categories					Total Damage
	AUTOS	COMM	EMERGENCY COSTS	RESIDENTIAL	ROADS	
0.9900	0.00	0.00	0.00	0.00	0.00	0.0(
0.9500	0.00	0.00	0.00	0.00	0.00	0.0(
0.9000	0.00	0.00	0.00	0.00	0.00	0.0(
0.8000	0.00	0.00	0.00	0.00	0.00	0.0(
0.7000	0.00	0.00	0.00	0.00	0.00	0.0(
0.6000	0.00	0.00	0.00	0.00	0.00	0.0(
0.5000	0.00	0.00	0.00	0.00	0.00	0.0(
0.4750	0.00	0.00	0.00	0.00	0.00	0.0(
0.4500	0.00	0.00	0.00	0.00	0.00	0.0(
0.4250	0.00	0.00	0.00	0.00	0.00	0.0(
0.4000	0.00	0.00	0.00	0.00	0.00	0.0(
0.3750	0.00	0.00	0.00	0.00	0.00	0.0(
0.3500	0.00	0.00	0.00	0.00	0.00	0.0(
0.3250	0.00	0.00	0.00	0.00	0.00	0.0(
0.3000	0.00	0.00	0.00	0.00	0.00	0.0(
0.2750	0.00	0.00	0.00	0.00	0.00	0.0(
0.2500	0.00	0.00	0.00	0.00	0.00	0.0(
0.2250	0.00	0.00	0.00	0.00	0.00	0.0(
0.2000	0.00	0.00	0.00	0.00	0.00	0.0(
0.1750	0.00	0.00	0.00	0.00	0.00	0.0(
0.1500	0.00	0.00	0.00	0.00	0.00	0.0(
0.1250	0.00	0.00	0.00	0.00	0.00	0.0(

Coyote Creek existing conditions
Exceedance Probablility - Damage Functions
for Damage Reach Rock Springs
(Damage in $1,000's)

Plan Name: Without, Without project condition
Analysis Year: 2003
Stream NameCoyote Creek

Exceedance Probability	Damage by Damage Categories					Total Damage
	AUTOS	COMM	EMERGENCY COSTS	RESIDENTIAL	ROADS	
0.1000	0.00	0.00	0.00	0.00	0.00	0.00
0.0750	0.00	0.00	0.00	0.00	0.00	0.00
0.0500	0.00	0.00	0.00	0.00	0.00	0.00
0.0400	519.52	9.62	39.83	1434.83	6.95	2010.75
0.0250	1105.77	20.48	84.77	3053.93	14.80	4279.74
0.0200	1216.06	22.52	93.22	3358.55	16.27	4706.63
0.0150	1309.54	24.25	100.39	3616.72	17.52	5068.42
0.0100	1335.29	24.73	102.36	3687.84	17.87	5168.08
0.0075	1335.29	24.73	102.36	3687.84	17.87	5168.08
0.0040	1335.29	24.73	102.36	3687.84	17.87	5168.08
0.0020	1335.29	24.73	102.36	3687.84	17.87	5168.08
0.0010	1335.29	24.73	102.36	3687.84	17.87	5168.08

Coyote Creek existing conditions
Expected Annual Damage by Damage Categories and Plans
for Analysis Year 2003
(Damage in $1,000's)

Plan Name	Plan Description	Damage Categorie		
		AUTOS	COMM	EMERGENCY COSTS
Without	Without project condition	49.70	0.92	3.81

Coyote Creek existing conditions
Expected Annual Damage by Damage Categories and Plans
for Analysis Year 2003
(Damage in $1,000's)

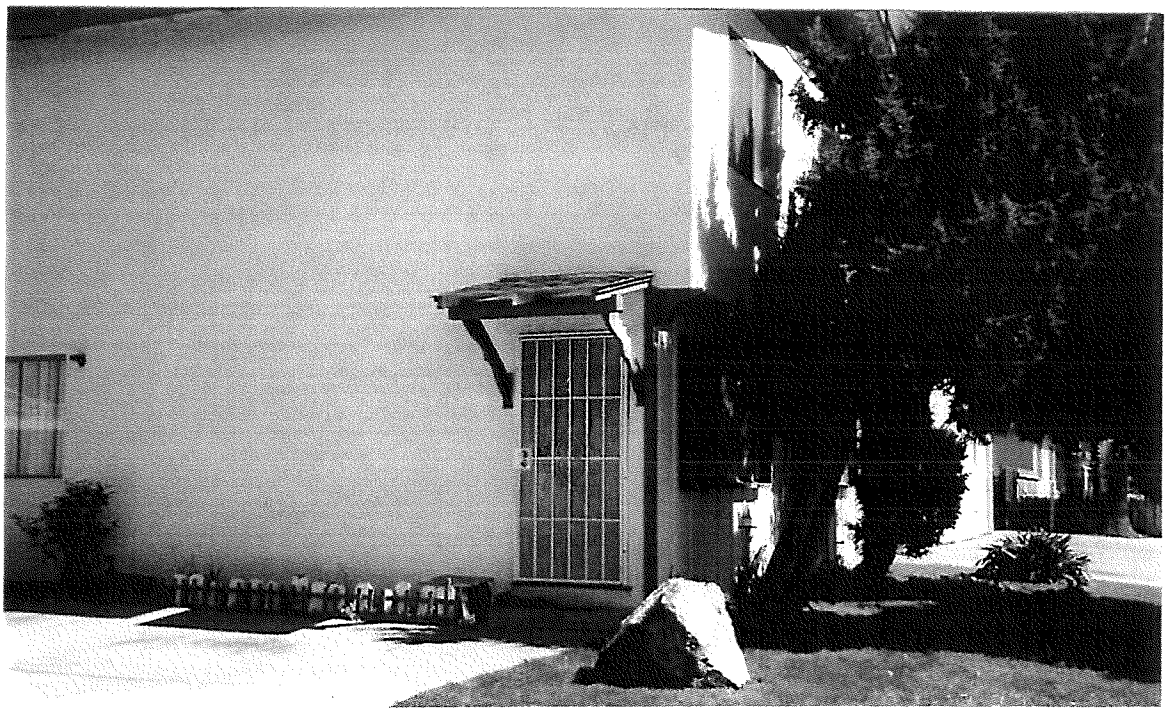
		Total Damage
RESIDENTIAL	ROADS	
137.26	0.67	192.35

APPENDIX B

PHOTOGRAPHS OF STRUCTURES IN THE FLOODPLAIN

Welch Ave.
High automobile population

Welch Ave.
Elevation



APPENDIX C

NEWSPAPER ACCOUNTS OF FLOODING

THE STORMS OF 1997

Reaching the saturation point

Highway 101: Caltrans officials want to know why drainage system worked in reverse.

BY FRANK SWEENEY
Mercury News Staff Writer

The underground pipe was designed to drain rainwater *off* Highway 101 into Coyote Creek.

Instead, it worked in reverse, channeling storm runoff *onto* the freeway and causing the flooding that shut down a 3.5-mile section in East San Jose on Sunday and kept some lanes under water Monday as well.

The problem may have been a malfunctioning valve, but "we still don't know 100 percent what happened," said Mike DiMarco, a spokesman for the Santa Clara Valley Water District.

Another round

A chance of showers is forecast for today.

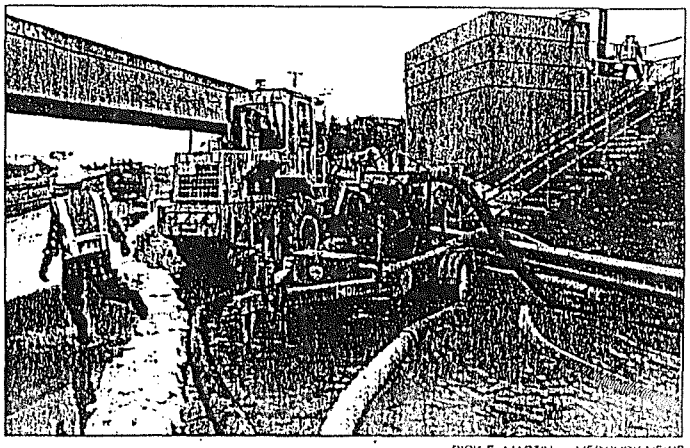
PAGE 8B

Engorged with rainfall and storm runoff that poured over Anderson Dam about 20 miles away near Morgan Hill, Coyote Creek ran so high that its water level was above the outlet end of the pipe. Water then flowed from the creek backward through the pipe — the first time that's ever happened, Caltrans spokesman Colin Jones said.

The California Department of Transportation on Sunday closed Highway 101 in both directions from Interstate 280-680 to Interstate 880. On Monday morning, after Caltrans crews had pumped out some of the water, traffic crept through a partially open freeway.

Late Monday, only one southbound lane remained blocked. It was expect-

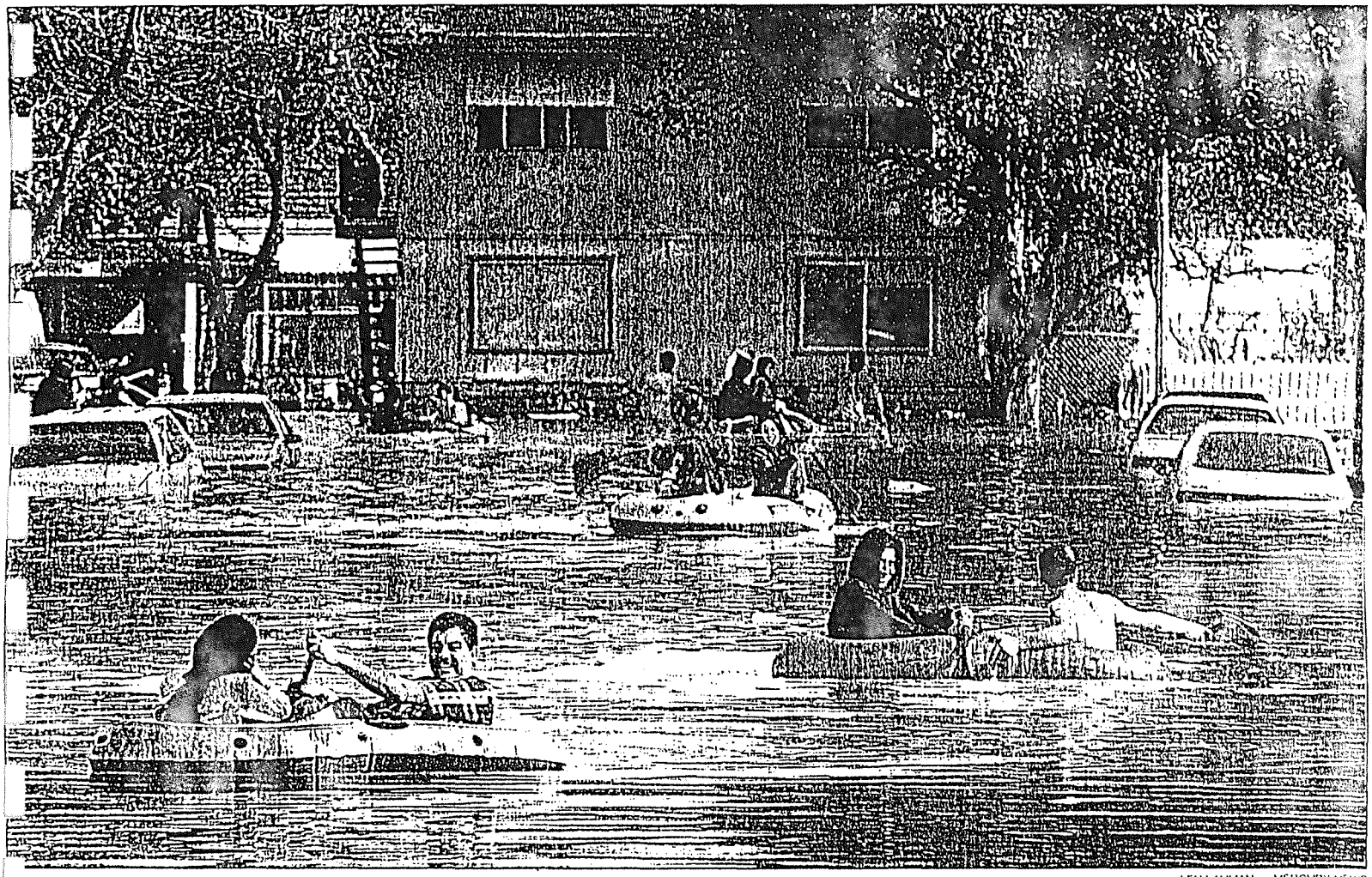
See FLOODING, Back Page



RICK E. MARTIN — MERCURY NEWS

Caltrans crews pump water off Highway 101 near McKee Road, where the freeway had been closed by the flooding.

Waterfront property: Dry spell came too late for neighborhoods near Coyote Creek.



LEN LAHMAN — MERCURY NEWS

Residents of Nordale Avenue use inflatable rafts for transportation Monday after Coyote Creek inundated the Kelley Park area. See story, **Back Page**.

THE STORMS OF 1997

Floodwaters went wrong direction

■ FLOODING

from Page 1A

ed to stay closed all night.

A flap valve to prevent this kind of reverse flow in the drainage pipe may have failed or been dislodged by debris, but water district and Caltrans officials said Monday they hadn't yet been able to make an inspection because the pipe remained under water.

The flap valve, on the creek side of the outfall pipe, is hinged at the top to open when water is flowing from the freeway and to close when the creek level is too high.

DiMarco said the creek didn't overflow its banks at Highway 101, although it did break through at three other locations Sunday and Monday.

Caltrans workers plugged the outfall pipe at the freeway end to stop the flow onto the pavement. Portable pumps were running for the second straight day to move floodwaters back into the creek so the freeway could be opened for evening commute traffic.

The flooding occurred where Highway 101 drops beneath a Union Pacific Railroad bridge north of McKee Road. Because the surrounding terrain is higher there, rainwater cannot drain from the underpass on its own.

Instead, rain collects in a concrete storage box below the pavement. When the water reaches a certain depth, a pump automatically comes on to put the water into the outlet pipe to the creek, explained Dan Beach, the Caltrans superintendent on the site.

It was the storms earlier last week rather than Saturday's rain that produced the high levels in Coyote Creek.

Saturday's rain, though part of the problem, "was really inconsequential," DiMarco said. "You have to take a look at the total picture, the saturated ground, the series of storms, the cumulative (flow) into the reservoirs."

"The watershed down south has taken the brunt of the storms this rainy season," said the spokesman for the water district, which maintains the creeks and is responsible for flood control.

"If we didn't have that rain Saturday, would this have happened? I don't think anybody can say, but I'm sure it didn't help," DiMarco said.

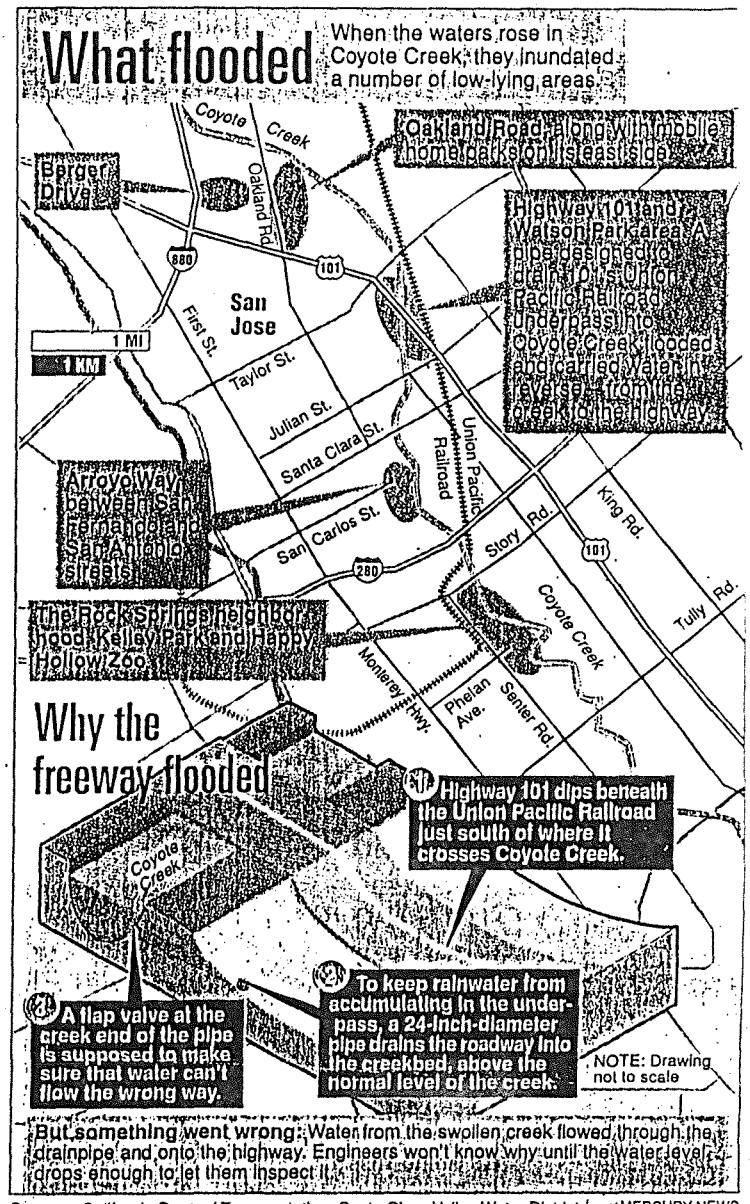
Torrential rains from those earlier storms fell on the already saturated Coyote Creek watershed in the Diablo Range, flowed down into already full Coyote Reservoir and spilled over Coyote Dam into Anderson Reservoir.

Anderson, which can hold more water than all of the district's other reservoirs combined, was nearly full from the New Year's Day storm. The more recent storms started sending water over the dam's concrete spillway Thursday.

When the surge arrived in San Jose, the creek overflowed in several areas, including the freeway railroad underpass near the confluence of Coyote and Silver creeks.

By 4:30 a.m. Sunday, when the freeway flooded, water was rushing through the creek at a rate of 32,744 gallons a second, and later in the day it peaked at 46,800 gallons a second, DiMarco said. Even so, it did not go over its banks near the railroad underpass, he said. "We've had crews walk the channel, and there was no overbanking," DiMarco said.

But the creek did flood in Kelley Park, spreading water south into the Rock Springs neighborhood. It also went over its banks along a number of streets north and south of East Santa Clara Street, flooding some homes.



Sources: California Dept. of Transportation, Santa Clara Valley Water District · MERCURY NEWS

Mercury Center

INSTRUCTIONS ON PAGE 2A

■ Look for updates on local forecasts and national weather conditions in Mercury Center at http://www.sjmercury.com/weather/.